

### Remarks

The Examiner rejected all of the claims under 35 U.S.C. §101. The independent claims have been amended. The claims as amended clearly meet the requirements of 35 U.S.C. §101 as interpreted by the Court of Appeal for the Federal Circuit.

In section 6 of the Office Action, the examiner states that the claims are non-statutory “because they not only recited a mathematical calculation but there’s no post-solution activity. For example, claim 1 limitations are processing all these steps (i.e. calculating and determining) but the claims doesn’t state the purpose, application or benefit. Summarily, the claims in this specific case have to merit some end result (e.g., for improvement mechanical efficiency).” In section 9, the examiner states that an invention meets the requirements of 35 U.S.C. §101 when it is a process “which produces a concrete, tangible, and useful result.” The examiner further states that “The claims are not tangible because they appear to recite a mathematical algorithm namely the band model method for modeling atmospheric propagation...by providing the spectral transmittances for at least the calculation of entrance aperture radiances, in a confined or limited space that doesn’t have specific preprocessing or post solution activity.”

MPEP Section 2106 addresses this situation. The MPEP makes clear that claims are not required to have specific preprocessing or post solution activity. For example, Section IIA states that “The claimed invention as a whole must accomplish a practical application. That is, it must produce a ‘useful, concrete and tangible result’”, citing the *State Street* case. This same section gives some examples of when the Federal Circuit has found claims to comprise statutory subject matter. For example, see the cited *AT&T* case, in which the court found the following claim to meet the requirements of 35 U.S.C. §101:

1. A method for use in a telecommunications system in which interexchange calls initiated by each subscriber are automatically routed over the facilities of a particular one of a plurality of interexchange carriers associated with that subscriber, said method comprising the steps of: *generating a message record for an interexchange call* between an originating subscriber and a terminating subscriber, and *including, in said message record, a primary interexchange carrier (PIC) indicator* having a value which is *a function of whether or not the interexchange carrier associated with said terminating subscriber is a predetermined one* of said interexchange carriers. (Emphasis added by the Court.) 50 USPQ2d at 1449.

The *AT&T* Court held that “It is clear from the written description of the ‘184 patent that AT&T is only claiming a process that uses the Boolean principle in order to determine the value of the PIC indicator. The PIC indicator represents information about the call recipient’s PIC, a useful, non-abstract result that facilitates differential billing of long distance calls by an IXC’s subscriber. Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of Section 101.” 50 USPQ2d at 1452.

The *AT&T* case is directly applicable to the claims in the present application. Take claim 1 for example. Claim 1 states that the provided data is divided into bins, and then certain absorptions are calculated from the data for each bin. Spectral transmittances are then determined. The spectral transmittances have a value which is a function of the calculated absorptions.

The spectral transmittances, like the PIC indicator in the *AT&T* claim, represent information that is useful. In the *AT&T* case, the information is about the caller recipient’s PIC, which is useful for billing purposes. In the present case, the spectral transmittances represent the

effect of the atmosphere on transmitted light, which is useful in the design and analysis of hyperspectral imaging sensors (see p. 4 lines 9-13 for a description of such useful, concrete and tangible uses of the predecessor MODTRAN radiative transport model, and p. 7 lines 9-12 for support that the present invention (termed “SERTRAN”) ‘retains all MODTRAN4 capabilities.’ The invention of claim 1 thus produces a useful, concrete and tangible result, and so is statutory.

The *AT&T* case sets forth law that must be followed by the Patent Office. The AT&T court found that the application of a Boolean principle to produce a useful, concrete, tangible result without preempting other uses of the principle comprises statutory subject matter under 35 U.S.C. §101. This exact reasoning applies in the present application. Accordingly, the claims must be statutory.

If for any reason the Examiner maintains this §101 rejection, in order to assist the Applicants in considering possible further claim amendments and/or arguments, the Applicants respectfully request that the Examiner “expressly state how the language of the claims has been interpreted to support the rejection” as required in MPEP §2106 IIA.

The Examiner rejected claims under 35 U.S.C. § 102 and 103 as set forth in the remainder of the Office Action. The claims as amended are clearly not anticipated by or obvious in light of the references. In section 12 of the office action, the Examiner stated that the bins of the Abreu reference each have a width of less than 1 wave number, citing column 4 lines 54-55. However, this portion of Abreu specifically states that the spectral resolution is 2 wave numbers, which is two times larger than 1 wave number. The fact that these bins are set out in steps of 1 wave number does not alter the direct statement of the resolution being 2 wave numbers. See also column 3 line 14 (stating that the spectral resolution is 2 wave numbers). It is absolutely

clear that Abreu does not disclose or suggest a resolution of less than 1 wave number as set forth in the present claims. Accordingly, Abreu cannot anticipate or make obvious applicant's claims.


The examiner also states that the Abreu bins cover the same spectral region as do applicant's bins. This is true, but is irrelevant to the claims, as the claims set out the spectral resolution, not the spectral region of interest.

Applicant also specifically references claim 16. The examiner found that this claim was obvious over Abreu in light of applicant's admission (see section 41 of the office action). The examiner cites to p.5 lines 20-23 of the application as comprising the admission. This portion of the application describes line tail calculations. However, claim 16 is directed to the calculation of line center absorptions, which are directly distinguished from line tail absorptions in claim 1. The correct support for claim 16 is found on p. 13 lines 3-13. Clearly, this subject matter is not disclosed on p. 5 of the specification, nor is it disclosed in the prior art.

In summary, as the references do not disclose each of the elements of any of the independent claims, all of the claims of the subject application are allowable over the references.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned in Westborough, Massachusetts, (508) 898-1501.

Respectfully submitted,



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